

Facilities Transition

Facilities Transition, Decontamination, and Decommissioning

Nuclear production at Hanford left a legacy of almost 465,000 square meters (5 million square feet) of building space. Many of these facilities were contaminated with radioactive and hazardous materials by nuclear operations, including nuclear reactors, reactor fuel fabrication plants, buildings where plutonium was chemically extracted from reactor fuel rods and purified, laboratories, and storage facilities.

Facilities that are no longer needed for their original function supporting nuclear operations are transitioned to a safe surveillance and maintenance state. Nuclear materials are safely handled.

Contaminated facilities are stabilized and protected so they require minimal surveillance and maintenance. These facilities will be decontaminated and ultimately decommissioned.

Uncontaminated facilities will be transitioned to the private sector to support the economic development of the region, or they will be demolished.

In the following six pages, the fiscal year 1998 accomplishments in the areas of Facilities Transition and Facilities Decontamination and Decommissioning are highlighted.

Goal

Safe, stable, secure onsite storage will be provided for all nuclear materials pending decisions on final disposition or until beneficial offsite uses are identified. Facilities without identified future uses will be transitioned to low-cost, stable deactivated conditions (requiring minimal surveillance and maintenance) pending eventual decontamination and decommissioning and removal or closure.

Fiscal Year 1998 Objectives

Key objectives included:

- decoupling the Waste Encapsulation and Storage Facility (WESF) from B Plant to allow stand-alone operation
- transitioning B Plant to a stable deactivated condition
- deactivating Nuclear Energy legacy facilities.

Stabilization activities focus on reducing the risk and mortgage costs associated with Hanford's former production plants and other nuclear facilities, while providing the monitoring and maintenance needed to ensure hazards to workers and the environment are minimized. Facilities that extracted and purified plutonium are multi-story buildings, typically 305 meters (1,000 feet) long, and constructed of concrete. Processing took place in canyons, long central areas in the buildings, which became highly contaminated. Cleaning out these canyons is a difficult process requiring the highest degree of technical expertise, attention to detail, and intricate safety planning.

In fiscal year 1998, significant progress was made in three areas: reducing risks to workers, the public and the environment; reducing the inventory and materials to be cleaned up; and applying innovative technology.

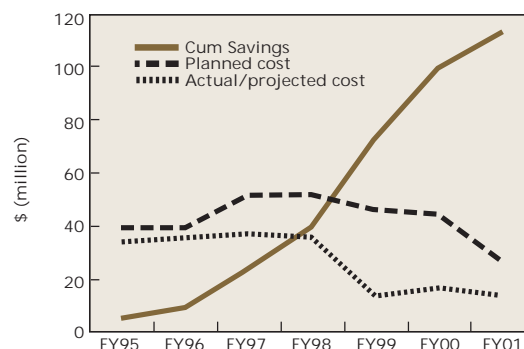
Reduced Risks: Dangerous Chemicals Removed

Deactivation of Nuclear Energy facilities continued during fiscal year 1998. Activities completed include cleaning sodium residuals from sodium testing equipment and 1720-DR tanks, draining the sodium potassium from the 337 Building, removing the sodium piping and tanks from T Plant, and draining the sodium from the tanks.

Reduction of Inventory and Materials: B Plant Deactivated, Cell Waste Processed

B Plant was deactivated on September 29, 1998, four years ahead of schedule, saving \$100 million. DOE and its contractors used innovative techniques to accelerate the project, including reengineering the organization to make it more efficient,

forming dedicated project teams, and using lessons learned from the successful early closure last year of the PUREX Plant, which chemically extracted plutonium from spent nuclear fuel rods. Major stages



Actual and projected cumulative savings at B Plant based on the planned costs set in the fiscal year 1995 Multi-Year Program Plan.



B Plant canyon before cleanup.



B Plant canyon in the final stages of cleanup.

of the cleanup included removal of contaminated organic solvent, decontamination of the canyon, installation of a new ventilation system, clean-out of miles of piping, and clean-out of the processing cells. The effort also involved decoupling the Waste Encapsulation and Storage Facility (WESF)—which stores 1,936 capsules of cesium and strontium—from B Plant. Surveillance and maintenance costs will drop from \$20 million per year to about \$750,000.

Additional transition progress was made at Hanford's 327 facility hot cells, where approximately 350 one-gallon buckets of cell waste had accumulated from past operations. This waste contains small metallic particles from radio-metallurgical examination of irradiated nuclear fuel, as well as irradiated test specimens and highly contaminated small equipment and tools. During the year, 236 of the buckets were evaluated, compacted

to reduce the volume, packaged in concrete- or lead-lined drums, and sent to the Hanford burial grounds.

Innovative Technology Applications: Deactivation Accelerated

In fiscal year 1998, new technology was deployed at B Plant that contributed to the accelerated deactivation. A two-dimensional gamma camera was used to map levels of radioactive contamination onto a video image of the survey area. The process took approximately six weeks, compared to 3 to 4 months using conventional methods. This technology is superior to conventional radiological survey methods since it reduces exposure to workers, provides more accurate readings, reduces schedule, minimizes waste generated, and provides retrievable data that can be archived for future decontamination and decommissioning work.

Accomplishments

- The WESF was decoupled from B Plant.
- B Plant was closed four years ahead of schedule, saving \$100 million.
- Non-radioactive sodium and sodium potassium were removed from several old facilities.
- More than 200 containers of highly radioactive transuranic waste were packaged and removed from Building 327.
- Material, equipment, and other radioactive debris and equipment containing 8.62 kilograms (19 pounds) of cesium-137, with over 750,000 curies of activity, were removed from Building 324.
- Hanford deactivation experts traveled to other sites to share expertise.
- Preparations for opening, venting, and sampling Tank 241-Z-361, containing many kilograms of plutonium, essentially were completed.

Near-Term Challenges

- The Fast Flux Test Facility (FFTF) is being maintained in standby status pending a decision by DOE on restart or shutdown. Until a decision is made, FFTF remains on standby.
- The Plutonium Finishing Plant (PFP) contains contamination and plutonium in various forms. Plutonium stabilization has been on hold for nearly two years pending resolution of safety concerns. Stabilization activities are expected to begin in January 1999.
- To eliminate a known vulnerability, workers must open, sample, and remediate tank 241-Z-361 at the PFP. This will alleviate nuclear criticality and hydrogen buildup concerns.